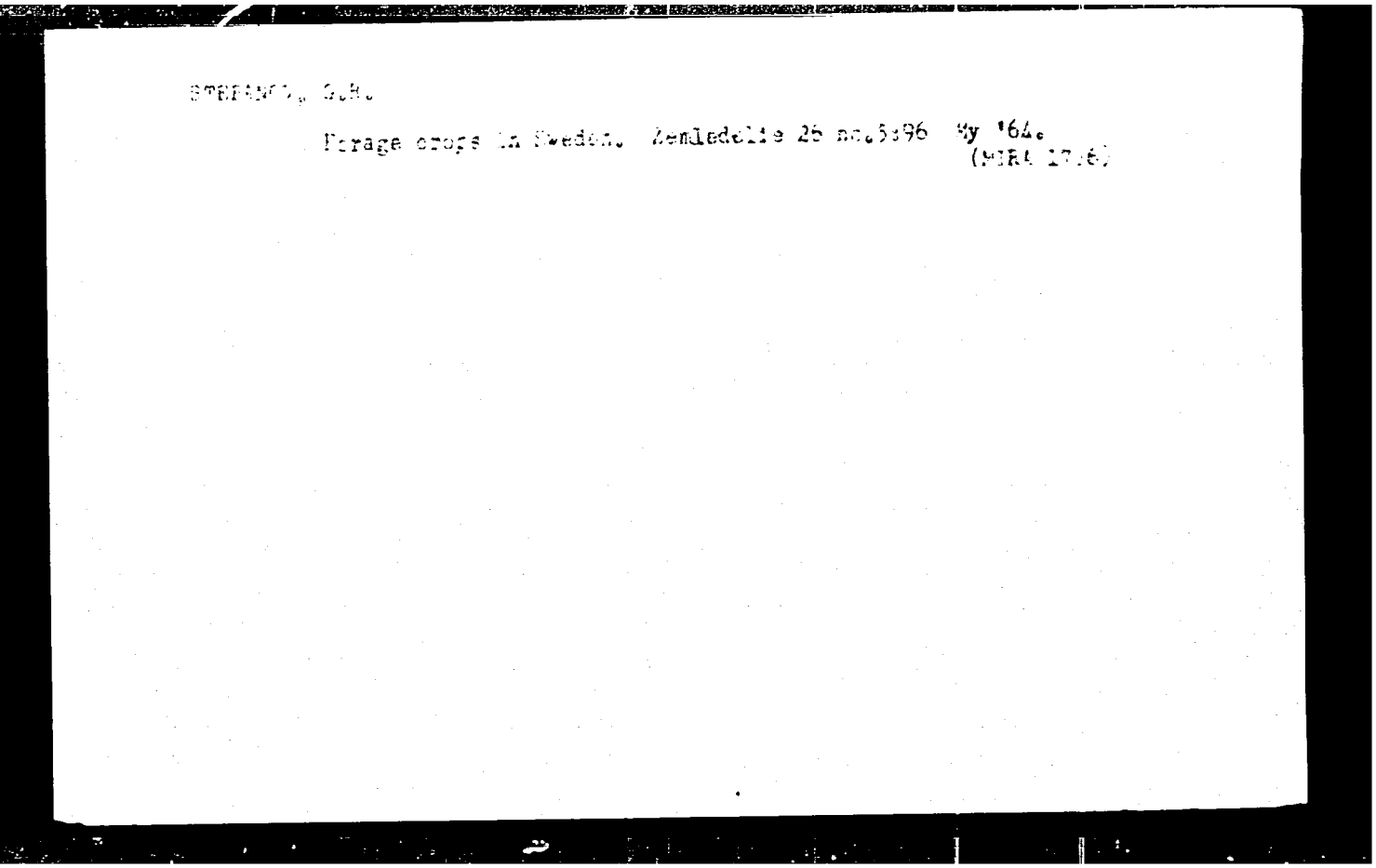
STEPANOV, G.R.

First results of growing forage beans. Zemledelie 24 no.8:50-53 Ag '62. (MIRA 15:9)

1. Zamestitel' nachal'nika Upravleniya semenovodstva Ministerstva sel'skogo khozyaystva SSSR.
(Beans)



[illegible], G.B.

Forage crops in Sweden. Zemledelie 25 no.5:96 My '64.
(MIRA 17:6)

STEPANOV, G. S.

4

1(4E2c)

Continuous extractor. I. Ya. Pomeranzko, B. P. Bitsenko-vich, and G. S. Stepanov. U.S.S.R. 106,043, Aug. 25, 1957. The structural and operational details of a continuous operation extractor for essential oils are given.
M. Hirshkan

11

STEPANOV, G.S., [illegible], G.N., (USSR)

"Certain Aspects of Excretion of Gonadotropins and Sex Hormones in Females in the Climacteric."

Report presented at the 5th Int'l. Biochemistry Congress, Moscow, 10-16 Aug 1961.

SAVCHENKO, O.N.; STEPANOV, G.S.

Fractionated determination of estrogens in the urine of non-pregnant women. Report No.1: Critical analysis of the methods of E.K. Kakushkin and V.G. Orlov. Probl.endok.i gorm. 7 no.2: 38-46 '61. (MIRA 14:5)

(ESTROGENS)

SAVCHENKO, O.N.; STEPANOV, G.S. (Leningrad)

Fractional determination of estrogens in the urine of non-pregnant women. Report No.2: Use of Brown's method. Probl.endok. i gorm. 7 no.3:42-48 '61. (MIRA 14:9)

1. Iz laboratorii vozrastnoy fiziologii i patologii cheloveka (zav. - chlen-korrespondent AMN SSSR prof. V.G. Baranov) Instituta fiziologii imeni I.P. Pavlova (dir. - chlen-korrespondnet AN SSSR deystvitel'nyy chlen AMN SSSR prof. V.N. Chernigovskiy) AN SSSR i laboratorii endokrinologii (nauchnyy rukovoditel' - chlen-korrespondent AMN SSSR prof. V.G. Baranov) Instituta akusherstva i ginekologii (dir. - chlen-korrespondent AMN SSSR prof. P.A. Beloshapko [deceased]) AMN SSSR.
(ESTROGENS) (URINE--ANALYSIS AND PATHOLOGY)

STEPANOV, G.S. (Leningrad)

Method for determining [redacted]dotropic hormones in urine. Probl. endok.i gorm. 7 no.3:49-54 '61. (MIRA 14:9)

1. Iz laboratorii endokrinologii (nauchnyy rukovoditel' - prof. V.G. Baranov) Instituta akusherstva i ginekologii (dir. - prof. P.A. Beloshapko [deceased]) AMN SSSR i laboratorii vozrastnoy fiziologii i patologii cheloveka (zav. - prof. V.G. Baranov) Instituta fiziologii imeni I.P. Pavlova (dir. - prof. V.N. Chernigovskiy) AN SSSR.
(HORMONES, SEX) (URINE--ANALYSIS AND PATHOLOGY)

STEPANOV, G.S.

Dynamics of the excretion of gonadtropic hormones in women of various age groups. Fiziol. zhur. 47 no.12:1496-1501 D '61. (MIRA 15:1)

1. From the Laboratory of Endocrinology, Institute of Obstetrics and Gynaecology, and the Laboratory of Human Physiology and Pathology of Ageing, I.P.Pavlov Institute of Physiology, Leningrad.
(GONADTROPIN)

STEPANOV, G. S.

Dissertation defended at the Institute of Physiology imeni I. P. Pavlov for the academic degree of Candidate of Medical Sciences: ~~1963~~ 1962.

"Gonadotropic Function of the Hypophysis at Climax and in Climacteric Neurosis."

Vestnik Akad Nauk, No. 4, 1963, pp. 119-145

STEPANOV, G. S.

Urinary excretion of gonadotropic and estrogenic hormones in dysfunctional uterine hemorrhages during the climacteric period. Akush. i gin. no.2:54-58 '62. (MIRA 15:6)

1. Iz laboratorii endokrinologii (nauchnyy rukovoditel' - deystvitel'nyy chlen AMN SSSR prof. V. G. Baranov) otdeleniya neoperativnoy ginekologii (zav. - prof. Ye. P. Maysel') Instituta akusherstva i ginekologii AMN SSSR (dir. - chlen-korrespondent AMN SSSR prof. P. A. Beloshapko[deceased]) i iz laboratorii vozrastnoy fiziologii i patologii cheloveka (zav. - deystvitel'nyy chlen AMN SSSR prof. V. G. Baranov) Instituta fiziologii imeni I. P. Pavlova (dir. - akad. V. N. Chernigovskiy) AN SSSR.

(GONADOTROPIN) (ESTROGENS) (CLIMACTERIC)
(HEMORRHAGE, UTERINE)

GUL', A.P.; SAVCHENKO, O.N.; STEPANOV, G.S.

Study of the estrogens in the daily urine of cattle. Fiziol. zhur. 48 no.1:91-94 Ja '62. (MIRA 15:2)

1. From the Laboratory for Physiology of Farm Animals and the Laboratory of Human Physiology and Pathology of Aging, I.P.Pavlov Institute of Physiology, Leningrad.
(ESTROGENS) (URINE--ANALYSIS AND PATHOLOGY)

SAVCHENKO, O.N.; STEPANOV, G.S. (Leningrad)

Interrelations between gonadotropins and estrogens in women during menopause. Probl. endok. i gorm. 9 no.3:54-62 My-Je '63. (MIRA 17:1)

1. Iz laboratorii vozrastnoy fiziologii i patologii cheloveka (zav. - deystvitel'nyy chlen AMN SSSR prof. V.G. Baranov) Instituta fiziologii imeni I.P. Pavlova (dir. - akademik V.N. Chernigovskiy) i laboratorii endokrinologii (nauchnyy rukovoditel' - deystvitel'nyy chlen AMN SSSR prof. V.G. Baranov) Instituta akusherstva i ginekologii (dir. - prof. M.A. Petrov-Maslakov).

SAVCHENKO, O.N.; STEPANOV, G.S.

Gonadotropins, estrogens and pregnanediol in the normal menstrual cycle. Probl. endok. i gorm. 10 no.4:7-13 Jl-Ag '64. (MIRA 18:6)

1. Laboratoriya vozrastnoy fiziologii i patologii cheloveka (zav.- deystvitel'nyy chlen AMN SSSR prof. V.G. Baranov) Instituta fiziologii imeni Pavlova (dir.- akademik V.N. Chernigovskiy) AN SSSR i laboratoriya endokrinologii (nauchnyy rukovoditel' - deystvitel'nyy chlen AMN SSSR prof. V.G. Baranov) Instituta akusherstva i ginekologii (dir.- prof. M.A. Petrov-Maslakov) AMN SSSR, Leningrad.

LIBERMAN, L.L.; RASKIN, A.M.; SAVCHENKO, O.N.; STEPANOV, G.S.

Mechanism of depressed sexual development in women with congenital virilizing adrenocortical hyperplasia. Probl. endok. i gorm. 10 no.4:13-17 Jl-Ag '64. (MIRA 18:6)

1. Laboratoriya endokrinologii (nauchnyy rukovoditel' - deystvitel'nyy chlen AMN SSSR prof. V.G.Baranov) Instituta akusherstva i ginekologii (dir. - prof. M.A.Petrov-Maslakov) AMN SSSR i laboratoriya vozrastnoy fiziologii i patologii endokrinnoy sistemy cheloveka (zav. - deystvitel'nyy chlen AMN SSSR prof. V.G.Baranov) Instituta fiziologii imeni Pavlova (dir. - akademik V.N.Chernigovskiy) AN SSSR, Leningrad.

BARANOV, V.G., prof.; ARSEN'YEVA, M.G.; RASKIN, A.M.; RAFAL'SKIY, Ya.D.; SAVCHENKO, O.N.; STEPANOV, G.S.; ALIPOV, V.I., red.

[Physiology and pathology of the female climacteric] Fiziologiia i patologiia klimakteriia zhenshchiny. Leningrad, Meditsina, 1965. 269 p. (MIRA 18:9)

1. Deystvitel'nyy chlen AMN SSSR (for Baranov).

BARANOV, V.G.; NIKOLAYENKO, N.P.; STEPANOV, G.S.

Treatment of diffuse toxi· goiter with potassium perchlorate combined with reserpine. Probl. endok. i gorm. 11 no.1:3-9 Ja-F '65. (MIRA 18·5)

1. Laboratoriya vozrastnoy fiziologii i patologii endokrinnoy sistemy cheloveka (zav. - prof. V.G. Baranov) Instituta fiziologii imeni Pavlova (dir. - akademik V.N. Chernigovskiy) AN SSSR i kafedra endokrinologii (zav. - prof. V.G. Baranov) Instituta usovershenstvovaniya vrachey imeni Kirova, Leningrad.

STEPANOV, G.V.

KNYAZHANSKIY, O.M., zaveduyushchiy; GANCHUK, N.S.; STEPANOV, G.V., glavnyy vrach.

Comparative study of elective nutrient media for the cultivation of dysentery and typhoid bacilli. (Authors' abstract). Zhur.mikrobiol. epid. i immun. no.3:65-66 Mr '53. (MLRA 6:6)

1. Bakteriologicheskaya laboratoriya Rostovskoy-na Donu tsentral'noi gorodskoy bol'nitsy (for Knyazhanskiy). 2. Rostovskaya-na-Donu tsentral'naya gorodskaya bol'nitsa (for Stepanov).
(Dysentery) (Typhoid fever) (Bacetriology--Cultures and culture media)

KNYAZHANSKIY, O.M., zaveduyushchiy; KOLODIY, O.M.; STEPANOV, G.V., glavnyy vrach.

Vi-phage types of B strains of typhoid and paratyphoid fever and their significance in epidemiological practice (Author's abstract). Zhur.mikrobiol.epid.i immun. no.7:78-79 Jl '53. (MLRA 6:9)

1. Bakteriologicheskaya laboratoriya Rostovskoy-na-Donu tsentral'noy gorodskoy klinicheskoy bol'nitsy (for Knyazhanskiy and Kolodiy). 2. Rostovskaya-na-Donu tsentral'naya gorodskaya klinicheskaya bol'nitsa (for Stepanov).
(Typhoid fever) (Paratyphoid fever) (Bacteriophagy)

SOV/109-3-8-4/18

AUTHORS: Kul'varskaya, B.S., Marchenko, V.B. and Stepanov, G.V.

TITLE: Emission Characteristics of the Oxides of Rare-earth Metals (Emissionnyye svoystva okislov redkozemel'nykh metallov)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 8, pp 1005 - 1009 (USSR)

ABSTRACT: The paper gives some experimental data on thermionic and secondary electron emission of various rare-earth oxides. The investigations were carried out on thin layers of rare-earth oxides having a thickness of about several thousand Å. The layers were obtained in a special device by evaporating the oxide from a tungsten vessel. The following characteristics were measured: the dependence of the secondary electron emission coefficient σ on the velocity of the primary electrons U_p, collector potential U_c and the incidence angle of the primary electrons φ. The results are shown in Figures 1 and 2 and in Table 1. Figure 1 shows $\sigma = f(U_p)$ for: 1) holmium oxide; 2) samarium oxide; 3) gadolinium oxide and 4) lutecium oxide. Figure 2

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represents $\sigma = f(U_p)$ for ytterbium oxide for various angles of incidence. The table shows the maximum secondary emission coefficient; this is found to vary from 1.7 to 2.83. The thermal emission characteristics of the oxides were studied on the basis of the Richardson curves. The measurements were carried out in a special, experimental diode, fitted with a directly heated tungsten cathode. The anode system consisted of three coaxial cylinders, the middle cylinder being the actual anode. The Richardson emission constants A and the work function φ were determined for the oxides of the following metals: Yt, La, Pr, Ne, Sm, Eu, Gd, Tb, Dy, Ho, Er, Yb, Lu and Th. These are shown in Table 2 (p 1007). Some of the Richardson curves are given in Figure 3. From the investigation, it is concluded that a number of rare-earth oxides, in particular, those of yttrium can be used successfully as emissive material in the cathodes where thorium oxides have been employed.

SOV/109-3-8-4/18
Emission Characteristics of the Oxides of Rare-earth Metals

The authors express their gratitude to Professor B.M. Tsarev for his constant interest in this work and for the discussion of the results and also to Yu.F. Sokolov for his help.
There are 3 figures, 2 tables and 8 references, 5 of which are Soviet and 3 English.

SUBMITTED: August 15, 1957

Card 3/3 1. Rare earth metal oxides--Properties 2. Secondary emission analysis 3. Thermionic emission 4. Thin films--Preparation

9(3) PHASE I BOOK EXPLOITATION SOV/3298

Stepanov, Genrikh Vladimirovich

Vtorichnaya emissiya v elektronnykh priborakh (Secondary Emission In Electron Devices) Moscow, Gosenergoizdat, 1959. 29 p. (Series: Massovaya radiobiblioteka, vyp. 332) 35,000 copies printed.

Ed.: I. F. Nekrasova; Tech. Ed.: N. I. Borunov; Editorial Board: A. I. Berg, F. I. Burdeynyy, V. A. Burlyand, V. I. Vaneyev, Ye. N. Genishta, I. S. Dzhigit, A. M. Kanayeva, E. T. Krenkel', A. A. Kulikovskiy, A. D. Smirnov, F. I. Tarasov, V. I. Shamshur.

PURPOSE: This booklet is intended for radio amatures with a theoretical background in electronics.

COVERAGE: The author outlines the principles of operation of electron devices with secondary emission, explains the physical basis of this phenomenon, and describes the various fields of application of these devices in modern electronic and radio equipment. No personalities are mentioned. There are no references.

TABLE OF CONTENTS:

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AVAILABLE: Library of Congress (TK7870.S84)

9.4310 26.1630 24917 S/181/61/003/006/014/031
B102/B201

AUTHORS: Stepanov, G.V., Pokalyakin, V.I., and Yelinson, M.I.

TITLE: Characteristics of the hot electron emission from natural p-n junctions in SiC crystals

PERIODICAL: Fizika tverdogo tela, v. 3, no. 6, 1961, 1762-1767

TEXT: The authors report on the electron emission from p-n junctions in SiC crystals in pulsed operation as depending upon the magnitude of the blocking voltage U and temperature T. SiC was chosen as the object of the investigation for being chemically somewhat inert and because the threshold energy of impact ionization in SiC is higher than the energy of electron affinity ($\varepsilon_i \simeq 4.3$ev, $\chi = 4$ev). The emission of hot electrons from natural p-n junctions in SiC (arising when growing α-SiC by the sublimation method) had been first studied in Ref.3. The 2 × 2 × 0.3mm sized single crystal specimens displayed the p-n junction on the (1000) face. The measuring apparatus is schematically shown in Fig.1. Negative square pulses were used (amplitude up to 400v, duration 2 μsec, repetition frequency 50 sec^{-1}), whereby the specimen could be kept at a constant

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temperature. The voltages were measured by an oscilloscope, and the emission currents by a tube electrometer (sensitivity $\sim 10^{-13}$a). The volt-ampere characteristics were recorded both in the forward and in the inverse direction at different frequencies and different temperatures. The rectification factor proved to be very small. In addition, the emission current i_e as a function of U was examined (which had been neglected in Ref.3). The emission centers were found to be bright points (electron gas, heated by high field-strength concentrations); the visible luminescence is a consequence of the recombination of hot electrons with impurities. The emitting points have linear dimensions of 10μ. With absolute values of $i_e \sim 50\mu$a the emission current densities are ~ 10a/cm^2 (which fits results of Ref.3). i_e rises with growing temperature and attains saturation even before the beginning of impact ionization; the i_e(U) curves shift with a rise of temperature toward lower U values. The effectivity of γ-emission ($\gamma = i_e/i_{through}$) is very small ($\gamma \sim 10^{-4}$); the γ (U) curves

Characteristics of the hot ...

display a maximum, the height of which is reduced with a rise of temperature. Sputtering of BaO raises i_e considerably, by one order of magnitude at best; $i_{through}$ (the current passing through the junction) is left practically unchanged in this connection. V.G. Sandomirskiy is thanked for his dicussions, and N.V. Sumin and A.M. Fadeyev for their assistance. There are 5 figures and 11 references: 2 Soviet-bloc and 9 non-Soviet-bloc. The most important references to English-language publications read as follows: Ref.2: J. Tanc. Nature, 181, No. 4601, 38, 1958; Ref.3: L. Patrick, W.J. Choyke. Phys. Rev. Lett., 2, No. 2, 48, 1959; Ref.8: L. Patrick JAP, 31, No. 8, 1505, 1960.

ASSOCIATION: Institut radiotekhniki i elektroniki AN SSSR Moskva (Institute of Radio Engineering and Electronics, AS USSR, Moscow)

SUBMITTED: January 6, 1961

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Characteristics of the hot ... 24917

Legend to Fig.1: K - SiC crystal, M - tantalum strip, for crystal heating, T - thermocouple, Д - attached nickel disk; C - electron trap, Э - willemite screen, И - BaO source. 1) Electrometer; 2), 3) oscilloscopes for measurement of voltage on crystal and of current through the crystal. 4) Generator; 5) Pulse generator; 6) source of collector voltage.

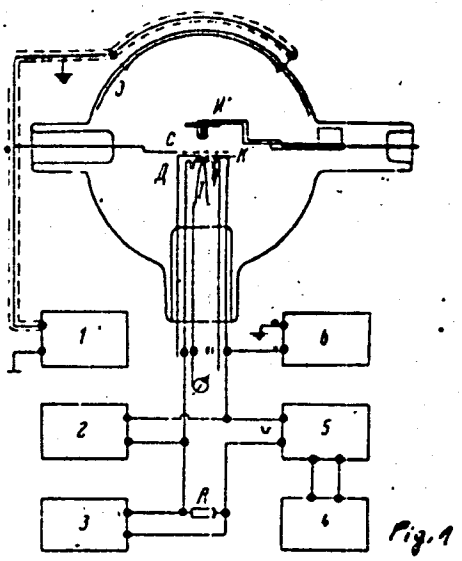

Fig. 1

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20583
S/109/61/006/002/015/023
E190/E435

AUTHORS: Yelinson, M.I., Stepanov, G.V. and Pokalyakin, V.I.

TITLE: Emission of Hot Electrons From p-n Junctions in SiC Crystals

PERIODICAL: Radiotekhnika i elektronika, 1961, Vol.6, No.2, pp.292-297

TEXT: The emission of hot electrons from natural junctions in SiC crystals is investigated as a function of the reverse voltage (U_n) across the junction and temperature (T). SiC is of particular interest, since $\varepsilon_i > \chi$ (Ref 1): (ε_i - threshold energy of impact ionization, χ - work function for hexagonal SiC; $\varepsilon_i = 4.3$ ev, $\chi = 4.0$ ev). Also its chemical inertness should give surface stability. According to R.Goffaux (Ref.4) and Ye.T. Kharlamova and G.F.Kholuyanov (Ref.5) the most favoured mechanism is that the partly ionized donor centres become ionized. Earlier experimental data of L.Patrick and W.J.Choyke (Ref.2) did not include variation of the emission current $i_э$ with field in the junction or with temperature, nor was the nature of the emission centres clarified. However, they did establish the high densities $j_э > 1$ amp/cm^2 and the law $i_э = i_{сж}^k$

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S/109/61/006/002/015/023
E190/E435

where i_{CKB} - current through the junction and k - constant. The apparatus and method are briefly outlined (Fig.1). The crystals were grown by sublimation and the presence of junctions established from electro-luminescence and the volt-amp characteristics. The crystals were selected for brightness when reverse biased. Surface preparation consisted in removing the SiO_2 film and polishing. Both d.c. and pulse voltages could be applied, the latter such that heating effects could be obviated, even at high reverse voltages. The emission current was measured with an electrometer of sensitivity $\sim 10^{-13}$ amps. The measured emission current was in the range 10^{-12} to 10^{-6} amps. The emission builds up with time under direct current and at elevated temperature ($\sim$400°C). After eight hours, the emission reaches a steady value and becomes very stable. This build up is probably related to the surface cleanliness. The junction voltage necessary for emission varies over a considerable range. Comparison of the pattern of emission on the luminescent screen with the pattern of light spots on the crystal showed the latter to be the source of emission. As U_n is increased, the number of

emission centres grows. The linear dimensions of the centres are from 1 to 10 μ. The current density, calculated from the sum of the areas of the emission centres is 1 to 10 amp/cm^2. This confirms the most important result of Patrick and Choyke (Ref.2). In Fig.2, the rapid growth over AB is particularly noticeable together with slow increase over BC. Curve 1 corresponds to a very rapid change of temperature with increasing voltage. For Curve 2, room temperature is maintained by use of 10 μ sec pulses over the whole voltage range. Curves 1', 2' are the corresponding emission currents. The slight fall in i_e for temperatures above 400°C may be due to lattice scattering. Pulse investigation carried out for temperatures of 20 and 75°C showed very weak temperature dependence in this range. This result disagrees with the theory of Sh.M.Kogan and V.B.Sandomirskiy (Ref.1) which is suitable for Ge and Si. Consequently, it seems that the increased scattering with increased temperature compensates for the increased number of electrons or that the field in the junction changes with temperature. The current saturates at a voltage which is still far below breakdown. In Fig.4, it is seen that the plot of i_e as a function of i_{ekB} is independent of temperature

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Emission of Hot Electrons ...

and voltage, i.e. the given value of $i_э$ always corresponds to a given value of i_{CK6}. This is explained by the high junction fields which depend only weakly on U_n (e.g. $E \sim \sqrt{U_n}$), acceleration is thus always adequate and not dependent on U_n and T. Emission simply increases with the number of carriers in the junction. Note the maximum of γ at the point B (the bend). Evidently over the portion BC a new scattering mechanism comes into play, the number of electrons capable of being emitted growing at a slower rate than total number of electrons. The relation between $i_э$ and i_{CK6} is also illustrated in curves taken at liquid nitrogen temperature. The curves in Fig.5 were taken on another crystal. The sharp increase has been established as being due to heating of the crystal. The maximum value of γ is about 10^{-4}, i.e. very small. Clearly this is due to losses in the very highly doped n-type layer, where the electric field is negligible. The following conclusions are arrived at:

1. The current densities are very high $j_э$ = 1 to 10 amp/cm^2 which is in agreement with Patrick and Choyke (Ref.2).
2. The emission is non-uniformly distributed over the surface.

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3. The temperature dependence is weaker than the theoretical dependence for Ge and Si; this is associated with the increased scattering nullifying the increase of carrier concentration with temperature.
4. The ratio γ is very small, about 10^{-4}. This is possibly related to scattering of electrons near the emitting surface; it has a maximum at a particular voltage U_n. The decrease of γ above this point is due to a new powerful scattering mechanism.
5. The emitted current is strongly associated with reverse current and independent of temperature and voltage. This is explained by the strong junction field which is always sufficient to accelerate the electrons.
Acknowledgments are expressed to V.B.Sandomirskiy for advice and to N.V.Sumin and A.M.Fadeyeva for assistance. There are 5 figures and 5 references: 2 Soviet and 3 non-Soviet.

SUBMITTED: September 7, 1960

Card 5/5

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001653210002-1"

AKOPOV, K.A.; KARELINA, N.A.; POKALYAKIN, V.I.; STEPANOV, G.V.

Interagency seminar on cathode electronics. Radiotekh.i elektron. 6 no.5:863-864 My '61. (MIRA 14:4)
(Electronics--Congresses)

L 63503-65 EPF(c)/EWP(j)/EWT(m) RPL RM/WW/JW

ACCESSION NR: AP5021285 UR/0020/65/163/005/1189/1190

AUTHOR: Amirkhanov, Kh. I. (Academician AN AzerbSSR); Stepanov, G. V.; Mursalov, B. A.

TITLE: Heat capacity C_V of heavy water near the critical point

SOURCE: AN SSSR. Doklady, v. 163, no. 5, 1965, 1189-1190

TOPIC TAGS: heat capacity, heavy water, deuterium compound, isochore, constant volume heat capacity, critical temperature

ABSTRACT: The heat capacity at constant volume (C_V) of heavy water containing 99.8% deuterium was investigated. Measurements of C_V along several isochores were conducted near the critical point, using an adiabatic calorimeter. It was shown that for H_2O the transition from the two-phase state to the one-phase state takes place with an abrupt jump for a specific volume $V = 2.5$ cm^3/g, while for D_2O the same transition is smooth. For $V = 2.7$ cm^3/g the same transition is smooth, for both H_2O and D_2O. While the critical temperature of D_2O could not be accurately determined.

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L 63503-65

ACCESSION NR: AP5021285

at this time, it may be assumed to exceed the value 370:9C accepted by some workers. Orig. art. has: 1 figure. [VS]

ASSOCIATION: Dagestanskiy filial Akademii nauk SSSR (Dagestan Branch, Academy of Sciences, SSSR)

SUBMITTED: 13Mar65 ENCL: 00 SUB CODE: NP

NO REF SOV: 004 OTHER: 001 ATD PRESS: 4073

Card 2/2

L 11552-66 EWT(d)/EWT(m)/EWP(w) LJP(c) EM
ACC NR: AP6002645 SOURCE CODE: UR/0021/65/000/011/1443/1446

AUTHOR: Stepanov, H. V. — Stepanov, G. V.; Pysarenko, H. S. — Pisarenko, G. S. (Academician, AN UkrSSR)

ORG: Institute of Problems of Material Science, AN URSR (Instytut problem materialoznavstva AN URSR)

TITLE: Approximate method of calculating the velocity of solid particles accelerated with a light-gas gun

SOURCE: AN UkrSSR. Dopovidi, no. 11, 1965, 1443-1446

TOPIC TAGS: hypervelocity impact, light gas gun

ABSTRACT: A simple, two-stage, light-gas gun for accelerating differently shaped solid particles to high velocities has been designed and built. The gun (Fig. 1) consists of explosion chamber 1 separated

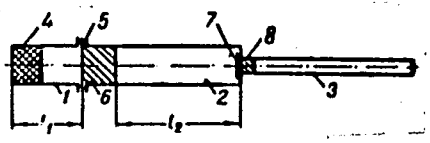

Fig. 1. Diagram of the light-gas gun.

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L 14552-66

ACC NR: AP6002645

by diaphragm 5 from compression chamber 2 containing piston 6 and filled with hydrogen or helium under a pressure of 5—15 atm. The compression chamber is separated by diaphragm 7 from gun barrel 3. During operation, powder charge 4 is detonated in the explosion chamber, creating a pressure of 1000—2000 atm. The pressure breaks down diaphragm 5 and "shoots" the piston along the compression chamber. Because of the piston kinetic energy, the light-gas pressure reaches a magnitude one order higher than that of the pressure of explosion products, breaks down diaphragm 7, and accelerates solid particle 8 to a very high velocity along barrel 3. The article offers a method for approximate calculation of the motion of the piston up to the moment of the breakdown of the second diaphragm and the motion of the accelerated particle. The data calculated by the suggested method agree fairly well (deviations do not exceed 5%) with the experimental data. Orig. art. has: 4 figures. [DV]

SUB CODE: 14, 19, 20/ SUBM DATE: 16Feb65/ ORIG REF: 001/
ATD PRESS: 4189

Card 2/2

ACC NR: AP7003244 (A) SOURCE CODE: UR/0198/66/002/012/0082/0085

AUTHOR: Stepanov, G. V. (Kiev)

ORG: Institute of Problems in the Science of Materials, Academy of Sciences, UkrSSR (Institut problem materialovedeniya AN U

TITLE: Effect of the scale factor in high-speed impact of targets by solid particles

SOURCE: Prikladnaya mekhanika, v. 2, no. 12, 1966, 82-85

TOPIC TAGS: copper, steel, lead, impact stress, impact test, acceleration test, gravitation effect, hardness, metal test

ABSTRACT: The results of experiments with centric impacting of massive targets (simulating a half-space) by balls 3 to 20 mm in diameter at speeds of 500 to 2000 km/sec are presented. Both the balls and targets were of lead. The manufacture of targets (massive blocks of commercial lead) and of balls (20; 14.5; 9; 4; and 3 mm in diameter), the acceleration of balls, the measurement of their velocity v (with accuracy of 2.5%), of the crater volume W, diameter D and depth L and techniques used are described. The experimental data are plotted in four logarithmic diagrams: three diagrams showing W, D, and L as functions of v, and one

Card 1/2 UDC: none

giving these quantities as a function of the ball mass. Formulas for calculating W, D, and L are also given. It is found that at these speeds, the volume of the crater in the target is proportional, over a wide range of impact speeds, to the energy of the impacting ball, the depth to $v^{2/3}$, and the diameter to $v^{0.6}$. The diagrams indicate that the scale factor is of negligible value in the range of speeds and variations in the mass of impacting balls used here. The results can be applied to impact of steel and copper targets by balls of the same material because, according to formulas, the values of W, D, and L depend on the same parameter $\lambda = \rho v^2/H$, where ρ - is the specific gravity, and H - the dynamic hardness of the material. Orig. art. has: 4 figures and 3 formulas. [VK]

SUB CODE: 20,11/ SUBM DATE: 06Dec65/ ORIG REF: 003/ OTH REF: 001/
ATD PRESS: 5113

STEPANOV, G.Yu., prof. (Moskva)

Why is "Dean's apparatus" impracticable? Priroda 52 no.7:85-91 Jl '63. (MIRA 16:8)
(Perpetual motion)

STEPANOV, G. Yu.

Hydrodynamic Studies of Turbine Grids" Obz. Byull. Aviamotorostroy. Nos. 4 and 5 (1949)

STEPANOV, G. YU.

Stepanov, G. Yu. Construction of double-rowed grids by the method of the hodograph of the velocity. Akad. Nauk SSSR. Prikl. Mat. Meh. 17, 593–598 (1953). (Russian)

Suppose the z-plane contains two infinite grids of airfoils with the same complex period. Consider incompressible flow through the double grid with velocity $\bar{V}_1(\bar{V}_2)$ at infinity up-(down-)stream. The hodograph is infinitely many sheeted with logarithmic branch points at $\bar{V}_1$ and $\bar{V}_2$. A single period strip in the z-plane maps onto the interiors of the images L_1' and L_2' of the two airfoils, which lie on two sheets connected along a cut joining two branch points $\bar{V}_{p1}$ and $\bar{V}_{p2}$ of the first order. The transformation $\frac{1}{2}(\zeta+1/\zeta)=(2\bar{V}-\bar{V}_{p1}-\bar{V}_{p2})/(\bar{V}_{p1}-\bar{V}_{p2})$, combined with transformations of the type $\zeta_n=(\zeta-\zeta_0)^{1/k}$ if L_1' or L_2' has corners, maps this doubly connected region onto a topological annulus in the ζ-plane. This can finally be mapped between concentric circles in a v-plane by $\zeta=\zeta(v)$, and then by $u=\ln v$ onto a rectangle, a pair of opposite sides being maps of the grid airfoils, where the stream function is constant. The complex velocity potential function $W(u)$ is doubly periodic and must have logarithmic singularities at $u(\bar{V}_1)$ and $u(\bar{V}_2)$. $W(u)$ can be expressed in terms of logarithms of Weierstrass σ-functions. To construct explicit double grid flows the author suggests the inverse procedure of choosing $W(u)$ and $\zeta(v)$, and ultimately returning to the z-plane by $z=\int dW/\bar{V}$. Also considered is the case in which both grids extend to infinity downstream, in which a period strip maps onto a circle, and the analog of $W(u)$ merely involves logarithms.

J. H. Giese.

STEPANOV, G. Yu.

65/103 533.695.5

Design of Cascade with Velocity Distribution Prescribed on the Circumference of a Cascade of Circles

Prikl.Mat.Mekh. 17(6),727-734 1953

U.S.S.R.

G.Yu. Stepanov

Index Aeronauticus March 1954 Aerodynamics

All methods of designing a plane hydrodynamic cascade in a steady potential flow of incompressible fluid with a prescribed velocity distribution can be generalized with the aid of Chaplygin's well known approximation for the case of a subsonic potential flow of gas. The practical application of this method, is however, limited to small density cascades owing to the necessity of expanding in a Fourier series a function with considerable oscillation within narrow intervals of the changes of argument. A method is, therefore, being considered of designing a cascade (with the aid of Chaplygin's approximation) with a distribution of velocity prescribed on the circumference of a cascade of circles thus ensuring sufficiently effective design of cascades with considerable density. (Bibl.8)

8/25/54

SOV/124-58-4-4087D

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 4, p 59 (USSR)

AUTHOR: Stepanov, G. Yu.

TITLE: Hydrodynamic Methods of the Calculation of Steady Flow Past the Cascades of Turbine-type Machines (Gidrodinamicheskiye metody rascheta ustanovivshegosya obtekaniya reshetok turbomashin)

ABSTRACT: Bibliographic entry on the author's dissertation for the degree of Doctor of Physical-Mathematical Sciences, presented to the In-t mekhan. AN SSSR (Institute of Mechanics, Academy of Sciences, USSR), Moscow, 1957

ASSOCIATION: In-t m khan. AN SSSR (Institute of Mechanics, Academy of Sciences, USSR), Moscow

1. Turbines--Hydrodynamic characteristics 2. Mathematics

Card 1/1

PHASE I BOOK EXPLOITATION 1107

Stepanov, Georgiy Yur'yevich

Osnovy teorii lopatochnykh mashin, kombinirovannykh i gazoturbinnykh dvigateley (Principles of the Theory of Turbomachinery, Compound and Gas Turbine Engines) Moscow, Mashgiz, 1958. 350 p. 6,000 copies printed.

Reviewers: Uvarov, V.V., Doctor of Technical Sciences, Professor; Inozemtsev, N.V., Doctor of Technical Sciences, Professor, (Deceased); Cherkasov, B.A., Candidate of Technical Sciences, Docent; Ed.: Yevgrafov, K.G., Engineer; Ed. of Publishing House: Monastyrskaya, A.M.; Tech. Ed.: El'kind, V. D., Managing Ed. for Literature on Machine Building and Instrument Construction (Mashgiz): Pokrovskiy, N.V., Engineer.

PURPOSE: This is a textbook approved by the Ministry of Higher Education of the USSR for senior students of machine-building vuzes who are not specializing in aviation. The book may also be useful for engineers working in the field of engine design.

COVERAGE: The book is based on a course in the theory of turbomachines given by

Card 1/5

Principles of the Theory (Cont.) 1107

the author begining in 1949. The text has been revised and supplemented. The author briefly describes the fundamentals of the theory of turbomachines, and gives an analysis of the method of calculation of these machines. A number of non-Soviet gas turbine engines are described. In order to follow the text without difficulty, the reader should be familiar with the principles of engineering thermodynamics. An extensive bibliography listed according to subjects is given. No personalities are mentioned. There are 80 references, of which 58 are Soviet, (including 3 translations), 13 English and 6 German.

TABLE OF CONTENTS:

Card 2/5

STEPANOV, G. Yu. (Moscow)

"On the Three-Dimensional Motion of a Turbulent Boundary Layer."

report presented at the First All-Union Congress on Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb 1960.

STEPANOV, G.Yu.

Concerning A.N.Sherstiuk's article "Determination of losses in turbine lattices at nonrated angles of attack." Izv. AN SSSR. Otd. tekh. nauk. Energ. i avtom. no.4:214-215 Jl-Ag '61. (MIRA 14:9)

(Turbines)
(Sherstiuk, A.N.)

SOV/6193

PHASE I BOOK EXPLOITATION

Stepanov, Georgiy Yur'yevich

Gidrodinamika reshetok turbomashin (Hydrodynamics of Turbine Blade Cascades) Moscow, Fizmatgiz, 1962. 512 p. 5000 copies printed.

Ed.: S. N. Shustov; Tech. Ed.: K. F. Brudno.

PURPOSE: This book is intended for scientific workers, degree students, and students in advanced courses at universities and power and polytechnic schools, and also for engineers specializing in hydrodynamic investigations of turbomachines. In order to follow the text it is sufficient to be familiar with general hydrodynamics and the theory of functions of complex variables.

COVERAGE: The book deals with steady (or averaged) flows of fluids around blade cascades. The steady flow is considered as the limit of unsteady conditions. Considerable attention is given to problems dealing with ideal inviscid fluid flows about cascades, which are important both in methodological and practical applications. It is mentioned that kinetic energy losses in actual viscous gas flows about blade cascades of existing turbomachines

Card 1/10 2

rarely amount to 20%, and in very modern machines do not exceed 4 to 5%. The main part of these losses is evaluated theoretically on the basis of ideal-fluid flow investigations. The influence of viscosity in the flow is indirectly determined in special vortex and stream filament models of an ideal-fluid flow and also by application of the boundary layer theory and numerous semiempirical formulas. The book contains some new results obtained by the author and his coworkers, V. T. Mitrokhin, L. G. Naumova, and V. L. Epshteyn between 1948 and 1958. Ya. A. Sirotkin cooperated with the author in the elaboration of Part Three and wrote sections 46 and 49 under the author's supervision and section 44 jointly with the author. The basic part of Ch. XI was written jointly by the author and Naumova. L. I. Romanova is credited with the major part of the calculations and graphs. The author thanks L. G. Loytsyanskiy, L. I. Sedov, N. A. Slezkin, B. S. Stechkin, and V. V. Uvarov for their interest and suggestions. There are 143 references: 96 Soviet, 23 English, 21 German, 2 French, and 1 Italian.

Card 2/12

BORISENKO, Aleksandr Ivanovich; STEPANOV, G.Yu., dokt, fiz.-mat. nauk, retsenzent; TARAPOV, I.Ye., kand. fiz.-mat. nauk, red.; TUBYANSKAYA, F.G., red. izd-va; ROZHIN, V.P., tekhn. red.

[Gas dynamics of engines] Gazovaia dinamika dvigatelei. Moskva, Gos. nauchno-tekhn. izd-vo, Oborongiz, 1962. 793 p. (MIRA 15:4)

(Gas dynamics) (Gas turbines)

STEPANOV, G.Yu.; FITTERMAN, B.M., kand. tekhn. nauk, retsenzent; GALANOVA, M.S., inzh., red.; MODEL', B.I., tekhn.red.

[Hydrodynamic theory of ground-effect machines] Gidrodinamicheskaia teoriia apparatov na vozdushnoi podushke. Moskva, Mashgiz, 1963. 92 p. (MIRA 17:2)

STEPANOV, G.Yu., prof.

"Operating processes of turbo-piston engines" by I.N. Nigmatulin. Reviewed by G.IU. Stepanov. Energomashinostroénie 9 no.5:45-46 My '63. (MIRA 16:7)

(Gas and oil engines)
(Nigmatulin, I.N.)

L 61860-65 EWT(d)/EWT(l)/EWP(m)/EWT(m)/WA/EPF(n)-2/FA(b)/EWA(d)/T-2/EWA(w)
Pd-1/Pu-4 WW

AM4037185 BOOK EXPLOITATION UR/ 629.1.03.001

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871

Stepanov, G. YU.

Hydrodynamic theory of ground-effect machines (Gidrodinamicheskaya teoriya apparatov na vozdushnoy podushke) Moscow, Mashgiz, 63. 0092 p. illus., biblio. 3,000 copies printed.

TOPIC TAGS: fluid mechanics, hydrodynamics, ground effect machine

PURPOSE AND COVERAGE: The book presents a classification of known jet systems of ground-effect (AVP) machines and explains their approximate hydrodynamic theory. Simpler AVP systems are compared on the basis of this theory, and their basic power parameters are evaluated. The peculiarities of the AVP design in steady motion are recorded. The work is intended for engineers and scientists working on AVP design and research and can be useful for everyone interested in the theory of ground-effect machines.

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L 61860-65
AM4037185

Conclusions -- 91
Bibliography -- 94

SUB CODE: AC, ME SUBMITTED: 15Aug63 NO REF SOV: 004

OTHER: 005

Card 3/3

GOGISH, L.V. ;STEPANOV, G.Yu. (Moscow)

"An approximate analysis of two-dimensional supersonic flows with characteristics of small curvature".

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 Jan- 5- Feb 64.

VIKHERT, M.M.; DOBROGAYEV, R.P.; LYAKHOV, M.[illegible] PAVLOV, A.V.; SOLOV'YEV, M.P.; STEPANOV, Yu.A.[deceased], SUVOROV, V.G.; STEPANOV, G.Yu., prof., red.

[Design and construction of motor-vehicle and tractor engines] Konstruktsiia i raschet avtotraktornykh dvigatelei. Izd. 2., perer. i dop. Moskva, Mashinostroenie, 1964. 552 p. (MIRA 18:4)

SEDOV, L.I.; STEPANOV, G.Yu.

Reviews. Inv. AN SSSR. Mekh. no.4:186-187 Jl-Ag '65.
(MIRA 18:12)

L 9556-66 EWT(d)/EWT(l)/EWP(m)/EWT(m)/EA/EPF(n)-2/EWA(d)/T-2/ETC(m) WW
ACC NR: AP5026279 SOURCE CODE: UR/0229/65/000/009/0006/0008

73
B

AUTHOR: Stepanov, G. Yu.

ORG: none

TITLE: Particulars on the hydrodynamic calculation of a jet curtain over a water surface

SOURCE: Sudostroyeniye, no. 9, 1965, 6-8

TOPIC TAGS: air cushion vessel, hydrodynamics, jet propulsion, jet thrust

ABSTRACT: The design of nozzle-type ACV's is based chiefly on experimentally and theoretically derived data from ACV's operating over a solid surface. These data cannot be applied to ACV's operating over water, where the deformation of its surface (see Fig. 1) must be considered. For hovering or annular-nozzle-type ACV's operating at low speed, formulas for their main parameter h/b (h = hovering height; b = nozzle width) are derived on the basis of the thin-jet theory [Stanton, I. R., Aerospace Engineering, vol. 20, no. 2, 1961], or the annular-jet theory [Times, R. W., Journal of the American Helicopter Society, vol. 4, no. 3, 1959]. The first formula provides usable results satisfactorily proved experimentally, at least for operation over a solid surface. The second formula asymptotically coincides with it at high h/b or x values ($x = p_b/p$, where p_b = air pressure in the nozzle and p = air cushion's pres-

Card 1/3 UDC: 629.12.039

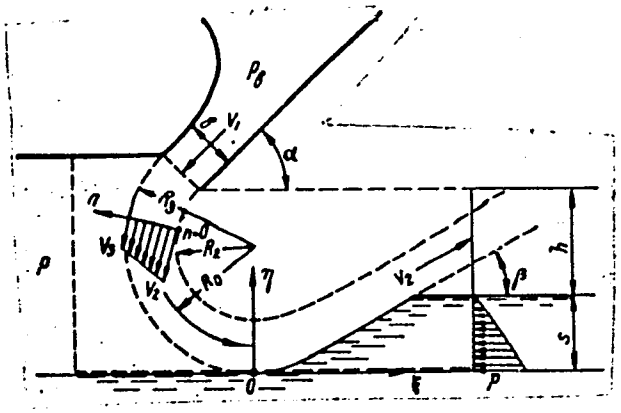

Fig. 1. The form of a jet over a water surface

sure) but gives excessively high values for the hovering height at low x values ($x < 1.2$). A third formula, derived on the basis of a method by G. Stepanov [Gidrodinamicheskaya teoriya apparatov na vozdushnoy podushke, Mashgiz, 1963], which introduces a momentum coefficient $\varphi < 1$ of the outlet jet, considers friction and vortex formation and yields a practically accurate coincidence with experimentally derived data. As shown on an ACV where $h/s = 3$ (s = lowering of the water surface) and a nozzle inclination against the horizon $\alpha = 45^\circ$ (see Fig. 2); the neglecting of the water-surface deformation leads to significant errors. An approximation can be ob-

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ACC NR: AP5026279

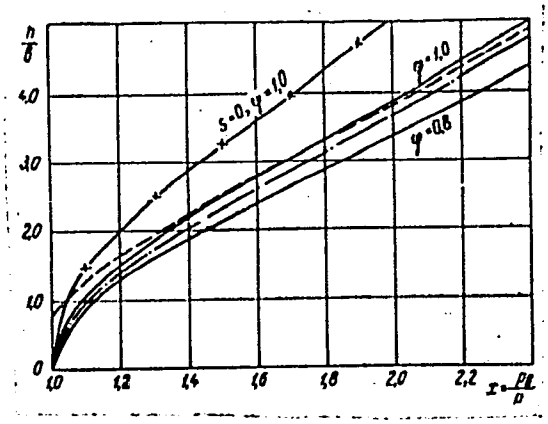

Fig. 2. The relative hovering height h/b relative to x = p B/p, where α = 45° and h/s = 3

-·-·-·- thin-jet theory; ----- annular-jet theory; ——— thin-jet theory, at various φ-values; -x-x-x- Stepanov's method, where s = 0 and φ = 1.0.

tained by using the first and third methods. Orig. art. has: 2 figures and 17 formulas. [GE]

SUB CODE: 20,21/ SUBM DATE: none/ ORIG REF: 002/ OTH REF: 002/ ATD PRESS: 4150

Card 3/3

L 1933-66 EWT(d)/EWT(m)/EWP(w)/FA/EWP(v)/T-2/EWP(k)/EWA(h)/ETC(m) WW/EM
ACCESSION NR: AP5023992 UR/0113/65/000/009/0024/0027
629.1.039.001.24

AUTHOR: Stepanov, G. Yu. (Doctor of physico-mathematical sciences); Arutyunyan, D. V. 114 55

TITLE: Calculating partially supported air cushion vehicles 21 6

SOURCE: Avtomobil'naya promyshlennost', no. 9, 1965, 24-27

TOPIC TAGS: air cushion vehicle, partially supported vehicle, nozzle system, chamber nozzle system, support coefficient, recycling coefficient

ABSTRACT: Four types of air cushion vehicles (ACV's) which are partially supported by conventional drive-wheels (see Fig. 1 of Enclosure) or caterpillars in contact with the ground are discussed and formulas are derived for calculating their main parameter h/b (h = hovering height, b = nozzle width) as well as the air cushion pressure p, the air intake G_v, the required power input N_n, the fan power, and the pulling power. A support coefficient K and a recycling coefficient K_R are introduced; K is a characteristic parameter for all types of partially supported ACV's and is defined as

$$K = \frac{G_G - G_W}{G_G} = \frac{G_L}{G_G},$$

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where G_G = total ACV weight, G_W = weight of the wheeled portion of the ACV, and G_L = lifting force; K_R characterizes type d ACV's only and is equal to the ratio of the airflow rate through the chamber to the total air intake. The power balance of a nozzle-type ACV, weighing 2400 kg and developing 60 km/hr at a 0.2-m hovering height, is shown relative to the support coefficient K for a reciprocating engine and a gas turbine power plant. The calculated parameters (Fig. 2) demonstrate the efficiency of partially supported ACV's with side skirts, the superiority of the chamber-nozzle type compared to the nozzle-type ACV, and they confirm the advantages of type d (simplest of the four types discussed). The total air intake G_V is mainly a function of the nozzle width b, but on the type d it is more affected by an increased pressure ratio p_f/p (p_f = fan's air pressure) than by b. The character of all parameter changes depends on the support coefficient K, the value of which increases at higher air-cushion pressure. Orig. art. has: 3 figures and 18 formulas. [GE]

ASSOCIATION: none

SUBMITTED: 00 ENCL: 02 SUB CODE: AC, PR

NO REF SOV: 002 OTHER: 000 ATD PRESS: 4115

L 1933-66

ACCESSION NR: AP5023992

ENCLOSURE: 01

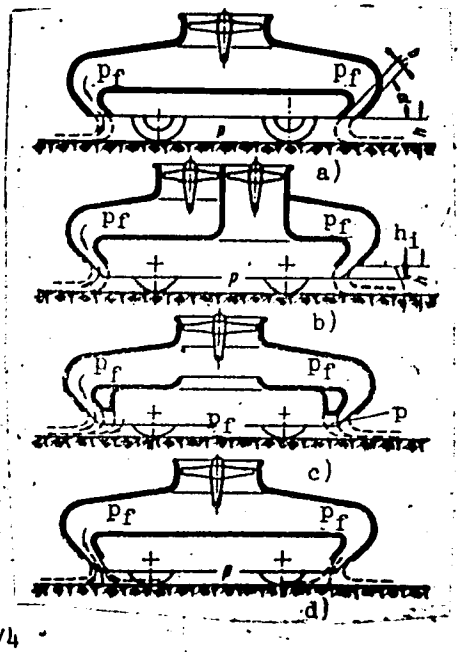

Fig. 1. Diagrams of partially supported ACV's

a - Nozzle system; b - chamber-nozzle system with divided air intake into the chamber; c - system with common air intake into the chamber and nozzles; d - same as c, except without a separate air intake into the chamber.

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L 1933-66
ACCESSION NR: AP5023992

ENCLOSURE: 02

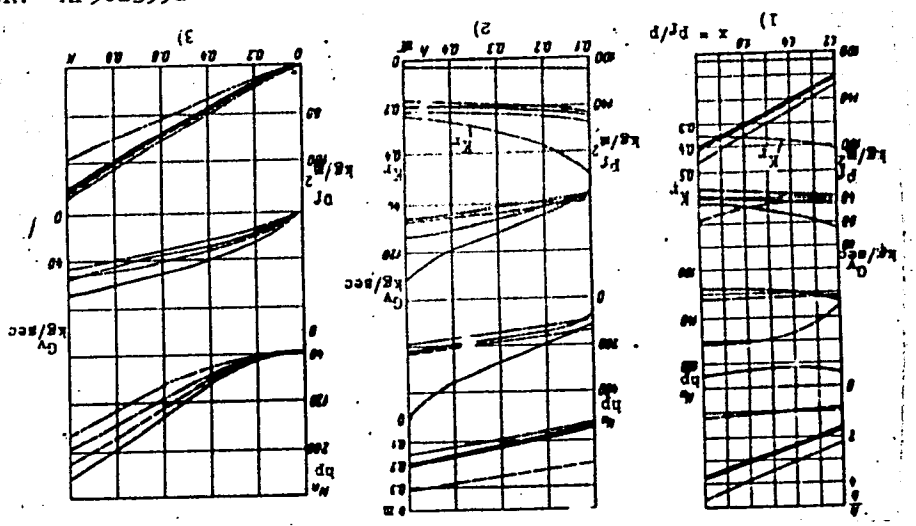
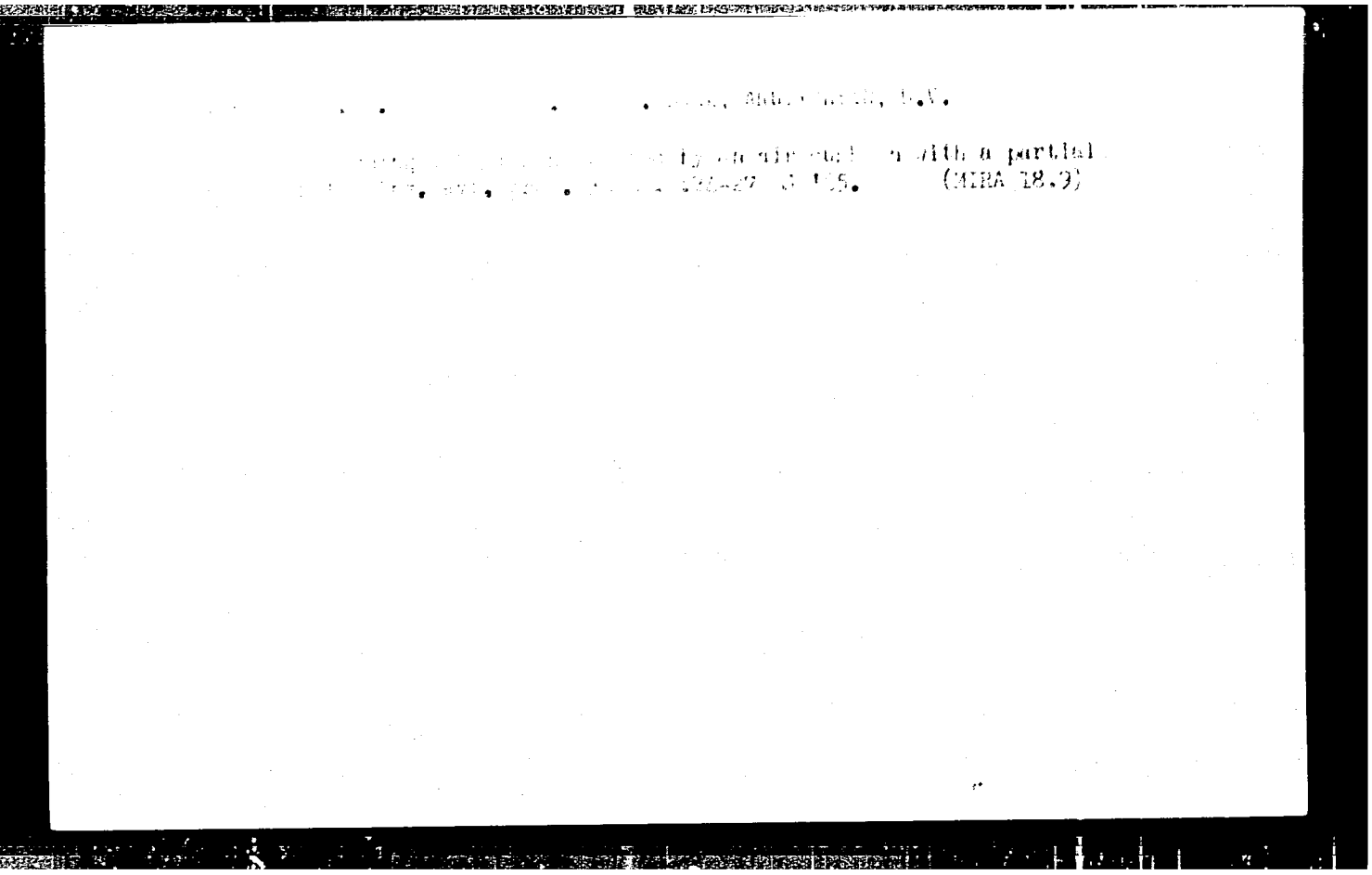


Fig. 2. Main parameters of partially supported ACV's relative to:

1 - $x = p_f/p$ ($h = 0.2$ m; $K = 0.75$); 2 - h ($x = 1.4$; $K = 0.75$);
3 - K ($h = 0.2$ m; $x = 1.4$) for chamber-nozzle systems, $h' = 0.05$ m.

Card 4/4

[redacted] electrical analogy for finding conformal representation [redacted] ring two-dimensional boundary problems. Inzh. zhur. 5 no.3: [redacted] 165. (MIRA 18:7)



L 42033-66 EWT(l)/EWP(e)/EWP(m)/EWT(m)/EWP(j)/T IJP(c) DS/IG/AM/JW/JAD/AG/AT/JT/RM

ACC NR: AP6010863 SOURCE CODE: UR/0421/66/000/001/0179/0184

AUTHOR: Stepanov, G. Yu.

CRG: none

170
111
B

TITLE: All-Union Conference on the Mechanics of Liquids and Gases

SOURCE: AN SSSR. Izvestiya. Mekhanika zhidkosti i gaza, no. 1, 1966, 179-184

TOPIC TAGS: physics conference, fluid mechanics, reentry aerodynamics, turbulent flow, hydrodynamics, filtration, turbulent heat transfer, fuel property, aerodynamic design, chemical mechanics, atmospheric physics, aerodynamic boundary layer, plasma dynamics, superfluidity, chemistry technique

ABSTRACT: The All-Union Conference on the Mechanics of Liquids and Gases, organized jointly by the Scientific Council on Fluid Mechanics of the Department of Mechanics and Control Processes of the Academy of Sciences USSR and the Academy of Sciences AzSSR, was held in Baku from 1 to 5 November 1965. The meeting was attended by 250 scientists from scientific-research, field, and other institutes of the academies of sciences of the USSR and of the union republics, and also from universities. Thirteen papers were presented on the main problems of the mechanics of fluids. Many specialists from various branches of industry took part in the preparation of a series of reports (aviation, oil, shipbuilding, etc.). Each report contained formulations of the general and

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ACC NR: AP6010863

the most important particular problems deserving further consideration, and also the development of these problems.

In his inaugural speech, L. I. Sedov, chairman of the Scientific Council on Fluid Mechanics, stated the goals and the work schedule of the Conference and stressed the value of fundamental investigations of new models of continuum, taking account of the properties of new materials, new effects on materials subjected to extreme conditions, physical and chemical effects, and correlation of mechanics with electrodynamics and biology.

In discussing the problems of mechanics of fluids, he cited the problems of increasing the velocity of motion of various bodies and vehicles in air and in water; the problem of optimal shapes, in particular, of reentry vehicles; the problems of decreasing drag by means of laminarization of the flow, additives to fluids, utilization of the elastic properties of streamlined surfaces and the attainment of a high degree of surface smoothness. He cited as related problems the unsteady motion of fluids and flow stability in general, and, in particular, the problems of flows of viscous fluid, low- and high-temperature plasma

d 2/13

In the field of turbulent flow, he stressed the need for advance formulation, statistical approaches, realization and theoretical generalization of numerous experimental data. The theory of turbulent motion is important for many practical problems in the development of MHD generators, mixtures of subsonic and supersonic jets and combustion, chemical technology, meteorology, and others. He emphasized the tremendous importance of modern means for computations which make it possible to solve the most complex problems of the mechanics of fluids.

The following 12 papers were read at the conference:

L. A. Galin. Evolution of the theoretical problems of filtration and underground mechanics of crude oil and gas. The author stressed the great number of problems of fluid motion in porous media in which the theory of filtration is combined with the theory of elasticity and plasticity, and with thermodynamics and chemical kinetics. The problems of three-dimensional and unsteady motion, including the motion of multiphase systems, investigation of additional effects of capillarity, and special properties of liquids and media are cited as being of great interest. Many other problems related to the theory of filtration, such as the interaction of foundations with soil, on the dynamics of rock deformation,

problems of chemical technology, on pseudo-liquified layers are enumerated. The necessity of using the numerical methods and developing experimental investigations is stressed.

M. T. Abasov and K. N. Dzhaliyev. Evolution of problems of underground hydrodynamics in Azerbaydzhan (presented by M. T. Abasov).

A. Kh. Mirzadzhanzade, A. A. Movsumov, and T. K. Saidrza. Hydrodynamic fundamentals of complex processes of oil well layout (presented by A. Kh. Mirzadzhanzade).

A. F. Kasimov, A. Kh. Mirzadzhanzade, A. M. Periverdyan, and Ye. I. Petroshevskiy. Gas-hydrodynamic investigations of oil output problems (presented by A. F. Kasimov).

L. G. Loytsyanskiy and A. S. Monin. Dynamics of viscous fluids, boundary layer turbulence, heat transfer (presented by L. G. Loytsyanskiy). The author cited the problem of turbulence as the most important problem of the theory of viscous flow, in all its numerous theoretical aspects, experimental methods and useful applications. He stressed the need for further development of a differential approach under various conditions,

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ACC NR: AP6010863

joint application of statistical, semi-empirical and empirical methods. The mechanism of the effect of gas compressibility and variation of its physicochemical properties on turbulent heat transfer at high velocities need to be elucidated. The importance of making the computations of turbulent boundary layers more precise is emphasized, including the problem of flow separation and generation of closed separation regions. The development of empirical methods for controlling turbulent flow structures whose goal is the optimization of various processes or diminution of drag as required by useful applications. In the latter case, the role of high-molecular additives and the physicochemical properties of the surface need to be investigated. The interest in laminar flow is promoted again by the requirements of space technology and also by new possibilities of numerical integration of the Navier-Stokes equations by computers. In laminar boundary layer theory, the approximate analytical solutions which can be obtained by using the universal boundary layer equations and parametric methods for their integration are of interest. The importance of boundary layer problems at high velocities is stressed and, in particular, those which account for equilibrium and nonequilibrium processes, diffusion and heat transfer phenomena, and the presence of multiphase and multicomponent layers in nonhomogeneous gases on alterable and inalterable surfaces. The great importance of nonlinear problems of

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boundary layer stability and transitions to turbulent layers is emphasized. The interaction of the boundary layer with external viscous flows at high Mach and low Reynolds numbers, characteristic of hypersonic flows over slender bodies, is considered the most urgent problem. The allied problems of supersonic flow comprise: flows behind a detached shock wave, separation region, and wake behind the body and base pressure.

G. N. Abramovich, N. Ya. Gembarzhevskiy, K. A. Ushakov, K. K. Fedyavskiy, and I. A. Shepelev. Industrial aerodynamics. Certain problems related to development of the theory and design of fans, blowers, various jet apparatus and windmills, and also to the problems of stability of constructions under the action of variable wind loads are discussed.

G. I. Barenblatt and V. G. Levich. Chemical mechanics — application of fluid mechanics to the problems of chemical technology, chemical kinetics, and rheology (presented by G. I. Barenblatt). The authors defined two categories of problems. The first is related to developing the theory of multiphase flows and the second to the motion of a suspended, "fluidized" layer in which various macrostructures are observable: a steady layer and a layer with bubbles and pockets. Investigations of the laws of phase mixture, heat transfer, and other physicochemical processes in

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the layer; the behavior of a polydisperse system; the interaction of different force fields and the effects of vibration are of interest. The great importance in chemistry and biology of investigations of flows of anomalous (non-Newtonian) liquids and deformation of elastic plastic (rheological) media is stressed. Detailed studies of new effects are needed, such as the appreciable effect of weak polymer solutions on flow properties in pipe, various periodical and aperiodical structures (the so-called "hard turbulence") appearing during extrusion of polymers through dies, and depending on the speed of flow. The authors stress the importance of strict mechanical descriptions of the process of flow and deformation, reversible and irreversible structural changes, the formulation and solution of boundary-value problems, taking account of such thermodynamic, chemical, and physical effects as heat emission, development of reactions, external radiation, lasers, etc. The significance of the problem of flame stability whose solution requires three-dimensional nonlinear formulation, more precise notions of stability, consideration of disturbances and the presence of various regions and phases is emphasized. Combustion of condensed systems (powders), vibrational combustion, and steady and unsteady flows of chemically active liquids near catalytic or disintegrating surfaces are first-priority problems.

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ACC NR: AP6010863

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A. I. Golubinskiy, A. A. Nikol'skiy, Yu. P. Rayzer, O. S. Ryzhov, and V. A. Smirnov. Problems of unsteady motion of a continuum (presented by A. I. Golubinskiy and Yu. P. Rayzer). According to the authors, the propagation and interaction of weak shock waves in the atmosphere and, in particular, the generation of "sonic booms" produced by supersonic aircraft are very urgent problems. Many problems arise in regard to unsteady flows over bodies, such as entry into gusts, unsteady motion of an aircraft, periodic flow separation, flutter of control surfaces. Problems of wave diffraction in flows over bodies of complex shape, flows with separation under unsteady conditions, and hypersonic and near-sonic flows are of interest. Equilibrium and nonequilibrium reactions, radiation, and surface destruction must be taken into account at hypersonic speeds, high temperatures, and high pressures. Further development of approximate analytical and qualitative methods are necessary for computing unsteady one-dimensional flows. Attention must be paid to the problems of expansion of gases in vacuum, jets for propulsion of space ships, and unsteady flows in the atmospheres of planets and stars (with gravity and relativistic effects taken into account). The physical aspects of unsteady problems are considered to be of great interest, and in this respect the investigations of meteorite impacts at

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high velocities, strong blasts at the boundary of a half-space, and, in particular, the effect of laser beams and the propagation of shock waves need to be carried out with real physical properties of the medium taken into account. In the experimental field, the production and investigation of high-intensity shock waves under the influence of strong magnetic fields and electric currents deserve great consideration. This course may lead to the production of cosmic velocities of a medium, and possibly to the attainment of conditions generating thermonuclear reactions.

V. V. Struminskiy, V. V. Sychev, and G. F. Telenin. Aerodynamics of high velocities (presented by V. V. Struminskiy). The speaker enumerated a series of new problems in the field of subsonic velocities which need to be investigated, such as: flows past airfoils near a solid or fluid surface (in nonlinear formulation), boundary layer flows (suction, injection, and various means of wing mechanization), and the effects of engine jets. Of particular importance are problems related to improving the aerodynamic qualities of wings (laminarization of the boundary layer) and stability of aircraft. Further research in the field of supersonic velocity must be directed toward solving the problems of: three-dimensional flow over bodies of complex shapes, transition flow at sonic velocity, the effect of body shape and atmospheric properties on shock

waves, and boundary layer control. At hypersonic velocities, similarity (blast analogy) and asymptotic methods are widely used; it is considered important to solve nonlinear problems, develop numerical methods, and to take account of viscosity, heat conduction, variation of thermodynamic properties of air, nonequilibrium processes, and kinetic theory. Such fundamental problems as the applicability of boundary-layer equations, interaction of the boundary layer with shock waves and external flows, and the structure of separated flows are to be considered in calculating hypersonic flows. The application of numerical methods needs to be extended and more attention should be paid to the problem of solvability, improvement of solutions of nonlinear problems, and, in particular, to a rational combination of numerical and asymptotic methods.

S. S. Voyt, P. S. Linyeykin, and N. N. Moiseyev. Motion of weighable and weightless liquids. This paper deals with the theory of waves, tides, and ocean streams, with particular attention paid to the history of the problem. The authors stressed the interest in a series of problems related to waves under weak gravitation as finite deviations from equilibrium forms of liquids, among them three-dimensional problems of motion of liquids in containers with breaks in continuity and the dynamics of a body filled with a fluid (applicable to motion of rockets). They also enumerated

problems related to the theory of gravitational waves, the theory of single waves, flows with low Froude numbers, waves on vortex streams, spectrum of progressing waves, and many others.

I. T. Yegorov, G. V. Logvinovich, A. B. Lotov, L. A. Epshtein, and Yu. L. Yakimov. High-velocity hydrodynamics./ This paper deals with the motion of bodies in water at high speeds. Two problems are cited as being of prime importance: 1) the cavitation and penetration of a body into a liquid with impact; and 2) the accurate solutions of axisymmetrical and three-dimensional problems, and the realization of rational theories of gas entrainment from cavities and their stability. Further research on the mechanism of cavitation and generation of cavities, motion of gas-liquid mixtures, and development of new theories and models was recommended.

M. N. Kogan, A. G. Kulikovskiy, G. A. Lyubimov, and G. G. Chernyy. Mechanics of plasma and rarefied gases (presented by M. N. Kogan and G. A. Lyubimov). This report deals with problems of the magneto-

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hydrodynamics of low-temperature plasma related to magnetic control of the aerodynamic and thermal characteristics of space ships and to investigations of ionized wakes and astrophysical problems. Their solutions require: more precise equations of motion and boundary conditions applicable to concrete technical systems and to investigated phenomena; more precise kinetic coefficients; and consideration of radiation, nonequilibrium processes, and physical processes on electrodes and in plasma. The problems of plasma stability and determination of critical conditions for transition of plasma into a turbulent state and the onset of self-oscillations are emphasized. In the field of rarefied gas theory, the main problem is said to be the choice of an appropriate model of the continuum and correct formulation of its boundary-value problem. The authors stressed the need for further investigations of the basis and bounds of applicability of the Boltzmann kinetic equations and for the development of numerical methods for their solution and rational approximation. A series of problems of great interest were formulated for the conditions of motion of space ships, for example, at high Knudsen K >> 1 and Mach M >> 1 numbers, when a molecular boundary layer of increased density develops near the surface of a body. The authors emphasized the importance of experimental facilities which make it possible to simulate flows over

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bodies in the real range of Mach and Knudsen numbers and also to obtain high-velocity molecular beams.

E. L. Andronikashvili, and Yu. G. Mamaladze. Quantum effects in liquids. This paper deals with vortex flows of superfluid helium 2 mixed with ordinary helium 1 which proceed with quantum circulation. The experimental investigations confirmed the phenomenological theory of interaction of normal and superfluid components of the liquid and showed the possibiltiy of realizing a "superfluid" gyroscope with practically no interference.

The proceedings of the conference will be used as a basis for the preparation of a collection to be entitled *Mekhanika v SSSR za 50 let* (Fifty years of mechanics in the USSR). [FSB: v. 2, no. 7]

SUB CODE: 20, 05 / SUBM DATE: none

Card 13/13 af

ACC NR: AT6020731 SOURCE CODE: UR/0421/66/000/003/0109/0114

AUTHOR: Gogish, L. V. (Moscow); Stepanov, G. Yu. (Moscow)

ORG: none

TITLE: Contribution to the calculation of the bottom pressure in two-dimensional supersonic flows /

SOURCE: AN SSSR. Izvestiya. Mekhanika zhidkosti i gaza, no. 3, 1966, 109-114

TOPIC TAGS: supersonic flow, pressure effect, detached shock wave, supersonic nozzle, Prandtl boundary layer

ABSTRACT: Since the published papers on the subject emphasize the behavior of the dissipative layer at the boundary of the detachment zone and pay little attention to the outer inviscid layer, the authors have developed a general approximate method of determining the bottom pressure in complex two-dimensional isentropic hypersonic flow. The approximation consists of using linear characteristic and a specified detached-flow hodograph. The influence of the dissipative layer is taken into account by means of a universal function - the permissible angle of rotation of the layer in the stream compression region. The results of the calculations are shown to be in satisfactory agreement with experimental data on the bottom pressure at the butt end of a cylinder, at the end surfaces in a flat channel following sudden expansion, and in a plane Prandtl-Meyer nozzle with a corner. The dependence of the bottom pressure on the features of the detached flow and its boundaries is determined on the basis of the

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L 19572-63 BDS MLK(a)
ACCESSION NR: AP3007718 S/0286/63/000/012/0066/0067

AUTHOR: Stepanov, G. Yu.

TITLE: Turbine blade profile. Class 46, No. 155362

SOURCE: Byul. izobret. i tovarn. znakov, no. 12, 1963, 66-67

TOPIC TAGS: viscous compressible flow, fluid flow, viscous flow, compressible fluid flow, blade design, turbine blade design, turbine blade, turbine efficiency, unseparated flow, blade profile, turbine blade profile

ABSTRACT: The patent introduces a blade profile for the flow of compressible viscous liquids. The profile is composed of convex and concave surfaces with given constant velocities and one or two diffusor sections on which a flow without separation is secured. Because the blade operates with minimum losses of the kinetic energy of the flow at a given velocity triangle, high operational efficiency is assured (see Fig. 1 of the Enclosure). Orig. art. has: 1 figure.

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L 19578-63
ACCESSION NR: AP3007718

ASSOCIATION: none

SUBMITTED: 14Sep50 DATE ACQ: 15Oct63 ENCL: 01

SUB CODE: PR NO REF SOV: 000 OTHER: 000

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L 19578-63
ACCESSION NR: AP3007718

ENCLOSURE: 01

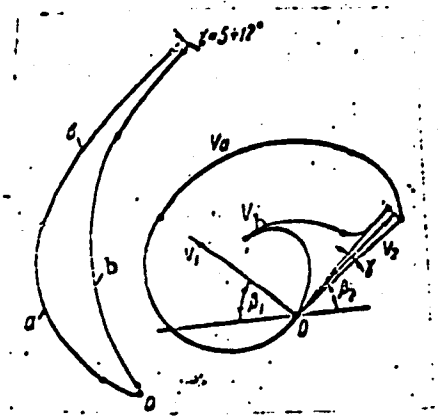

Fig. 1. Turbine blade profile

a - Convex surface; b - concave surface; V_a, V_b - constant flow velocities; V_1, V_2 - diffusor velocities.

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STEPANOV, I., kandidat tekhnicheskikh nauk.

Causes of production losses in limestone quarries. Strei. mat. izdel. i konstr. 1 no.12:7-8 D '55. (MLRA 9:7)
(Quarries and quarrying)

STEPANOV, I., kandidat tekhnicheskikh nauk; KHASKEL'BERT, I., inzhener.

Device for determining the consistency of bottom material in spoil pipes. Stroi.mat., izdel.i konstr. 2 no.5:20-22 My '56. (MLRA 9:8)

(Dredging)

STEPANOV, I., inzhener.

Technology abroad; wood chip slabs made using resinous glues.
Strei.mat.izdel.i konstr. 2 no.3:35-36 Mr '56. (MLRA 9:7)
(Great Britain--Hardboard)

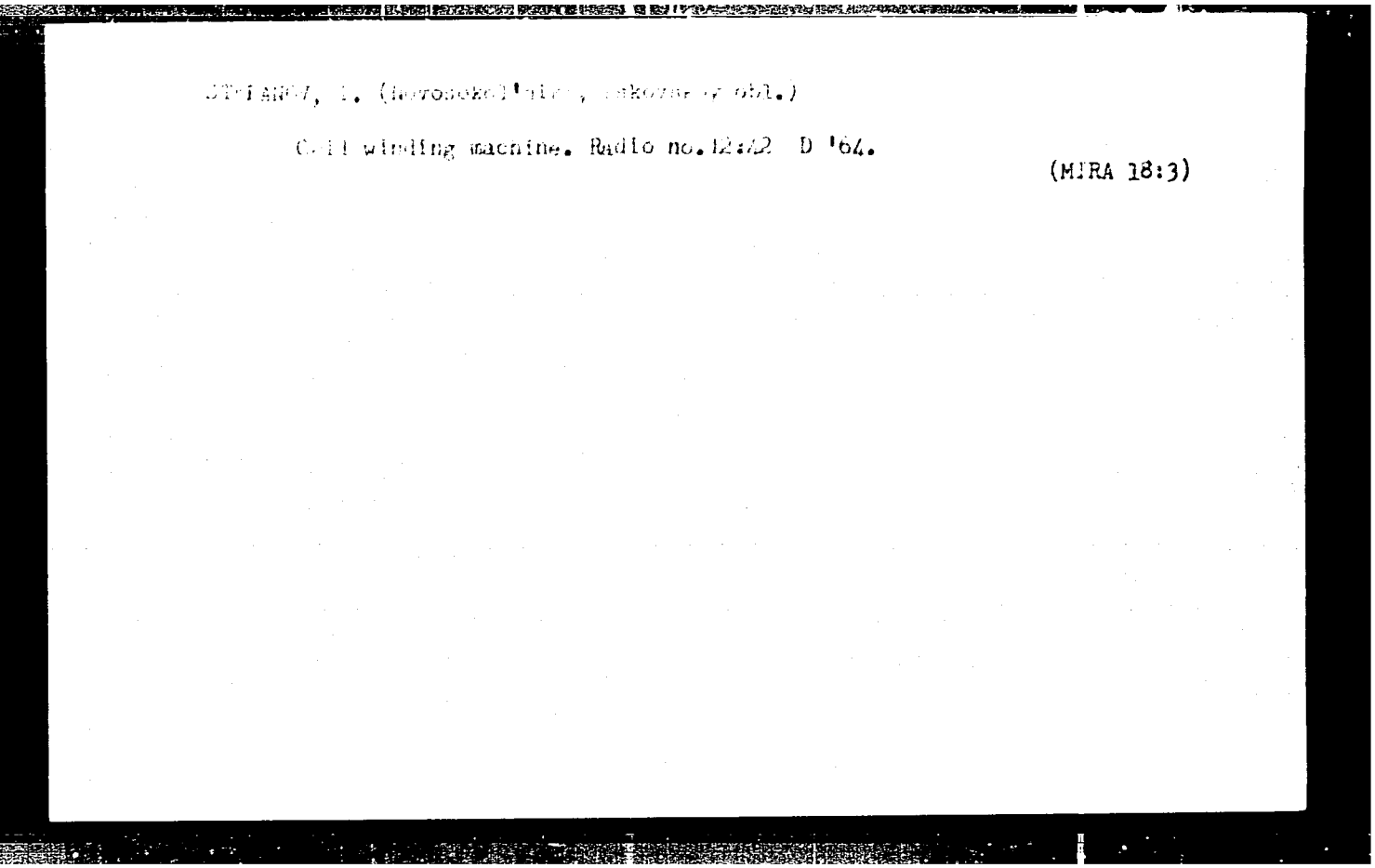
NISNEVICH, M.; STEPANOV, I.

Volumetric weight of rock products. Stroi. mat., izdel. i konstr. 2 no.8:16-17 Ag '56. (MLRA 9:10)

1. Zaveduyushchiy laboratoriyey kamennykh stroitel'nykh materialov Vsesoyuznogo nauchno-issledovatel'skogo instituta zhelezobetona (for Nisnevich) 2. Zaveduyushchiy laboratoriyey gidromekhanizatsii Vsesoyuznogo nauchno-issledovatel'skogo instituta zhelezobetona (for Stepanov).
(Building materials)

STEPANOV, I.

Our contribution to the development of independent Ghana. Vnesh. torg. 42 no.10:11-13 '62. (MIRA 15:10)
(Ghana--Economic assistance, Russian)



STRANOV, I. (Novosibirsk); [illegible] oblast)

C-11 winding machine. Radio no.12:42 D '64.

(MIRA 18:3)

KIKAVA, O.; STEPANOV, I.

Effectiveness of electric heating. Na stroi.Kos. 6 no.2: 20 F '65. (MIRA 19:1)

1. Glavnyy inzh. TSentral'noy nauchno-issledovatel'skoy laboratorii (for Kikava). 2. Direktor TSentral'noy nauchno-issledovatel'skoy laboratorii (for Stepanov).

MEDVEDEV, Yu.; STEPANOV, I.

Magnetohydrodynamic generator. Izobr.i rats. no.1:16-19 Ja '61.
(Magnetohydrodynamics)

STEPANOV, I.

Simplest system for connecting electric generators in parallel. Muk.-elev.-prom.21 no.8:26 Jl[Ag] '55. (MLRA 8:12)

1. Tatarskaya respublikanskaya kontora Zagotzerno
(Electric generators)

[redacted], L.A.

Balance of wave energy for a water area with variable depths.
Okeanologiia 4 no.6:978-986 '64. (MIRA 18:2)

1. Leningradskiy institut vodnogo transporta.

TARASOV, V.M., inzh.; KAZIMIRCHIK, P.K., inzh.; STEPANOV, I.A., red.; SIDEL'NIKOVA, L.A., red.izd-va; BACHURINA, A.M., tekhn.red.

[Handbook of time norms for mechanical repair work in the woodworking industries] Spravochnik norm vremeni na remontno-mekhanicheskie raboty v lesopil'no-derevoobrabatyvaiushchei promyshlennosti. Moskva, Goslesbumizdat, 1958. 319 p. (MIRA 12:10)

(Woodworking industries--Management)

Country : USSR
Category : Farm Animals. Q
Cattle.
Abs. Jour : Ref Zhur-Biol., No 21, 1958, 96858

Author : Stepanov, I. A.
Institut. : -
Title : Some Data on the Effect of Cobalt and Cod-Liver Oil upon the Organism of Calves.

Orig Pub. : Zhivotnovodstvo, 1957, No 9, 76-77

Abstract : Calves of the Ost-Friesland breed 1-2.5 months of age were divided into 3 groups. The 1st group received 10 mg of $CoCl_2$ with their fodder, the 2nd group received 10 mg of $CoCl_2$ and 20 g of cod-liver oil per day. The 3rd (control group) did not receive any additions to fodder. At the termination of the experiment the weight gains in calves of the 2nd group were by 23 percent higher than of the 1st group and 34 percent higher than of the control

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STEPANOV, I.A., aspirant

Some data on helminth infection of farm animals in Mordovia and measures for their prevention. Uch. zap. Mord. gos. un. no.13:180-185 '60. (MIRA 15:11)

1. Kafedra zootekhnii Mordovskogo gosudarstvennogo universiteta.
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MANOS, M.I., inzh.; STEPANOV, I.A., inzh.

Eccentric chuck for clamping bushings during centrifugal lining.
Mash.Bel. no.6:201-202 '59. (MIRA 13:6)
(Chucks)

STEPANOV, I.A.

Increasing the strength of the stems of forging hammers by rolling them with a special three-roller device. Trakt.i sel'khozmash. 30 no.10:39-40 O '60. (MIRA 13:9)

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